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F. E. CASH AND H. B. HUMPHREY

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DEPARTMENT OF COMMERCE--BUREAU OF MINES

FATAL ACCIDENTS IN ALABAMA COAL MINES DURING 1930[1]

By F. E. Cash[2] and H. B. Humphrey[3]

Sixty-one fatal accidents were reported in the mines of Alabama during 1930. This number is a decrease of 15 per cent as compared with 1929; however, production was 13 per cent and the man-hours worked were 16 per cent less than in the previous year. There were 21,731 men employed inside and 3,386 outside.

Table 1 gives the comparative rates per million tons and per million man-hours for the United States and for Alabama for 1929 and 1930. These rates are based on figures published by the State and by the United States Bureau of Mines, with preliminary figures for 1930. (These sources of data are used throughout this paper.)

Table 1. - Fatality rates in Alabama during 1930

Year	Deaths per million tons		Deaths per million man-hours worked	
	United States	Alabama	United States	Alabama
1929	3.59	3.91	1.87	1.40
1930	3.80	3.80	1.96	1.40
Average for 1926-1930	3.76	4.57	1.87	1.63

The fatality rate based on production was 3.91 per million tons in 1929 and 3.80 in 1930 for Alabama whereas for the United States the rate rose from 3.59 in 1929 to 3.80 in 1930; the improvement in Alabama was due to a decrease in fatalities and possibly to increased efficiency of labor through the growing use of mechanical mining methods. The rate for the United States was increased, largely because of a decrease of 13 per cent in production and a decrease in fatalities of only 8 per cent by reason of a large increase in deaths from explosions and roof falls. Table 2 shows how much coal was mined and how many hours of work were performed during the past two years.

1 - The Bureau of Mines will welcome reprinting of this paper, provided the following footnote acknowledgment is used: "Reprinted from U. S. Bureau of Mines Information Circular 6519."

2 - District engineer, U. S. Bureau of Mines Safety Station, Birmingham, Ala.
3 - Assistant engineer, U. S. Bureau of Mines Safety Station, Birmingham, Ala.

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Table 2. - Production and labor in Alabama during 1930

Year	Coal, tons		Man-hours		Tons per man-hour	
	United States	Alabama	United States	Alabama	United States	Alabama
1929	608,817,000	18,416,000	1,225,000,000	51,683,000	0.50	0.36
1930	531,432,000	16,100,000	1,025,000,000	43,423,000	0.52	0.37
Average for 1926-1930	590,436,000	18,856,000	1,191,600,000	53,220,000	0.50	0.36

The tonnage mined per fatality is given in Table 3.

Table 3. - Tons of coal mined per fatality in Alabama during 1930

Year	Men killed		Tons per man killed	
	United States	Alabama	United States	Alabama
1929	2187	72	277,920	255,778
1930	2015	61	263,730	262,000
Average, 1926-1930	2223	86	53,126	43,648

In 1930, Alabama produced about 3 per cent of the coal mined in the United States and had about 3 per cent of the fatalities. Some excellent records were made and maintained; some mines produced one-half to three-quarters of a million tons of coal without a fatality.

Table 4 gives the fatality rates by classes of mines -- that is, grouped by tonnage.

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Table 4. - Fatality rates in Alabama coal mines during 1930

Class	Year	Mines	Tons	Man-hours	Fatalities	Fatalities per million	
						Tons	Man-hours
Class I, under 10,000 tons	1929	84	163,207	810,000	2	12.25	2.47
	1930	93	164,000	776,000	3	18,30	3.88
Class II, 10,000 to 50,000 tons	1929	37	847,871	2,793,000	13	15.35	4.64
	1930	26	660,000	2,148,000	3	4.54	1.39
Class III, 50,000 to 100,000 tons	1929	33	2,441,950	7,345,000	10	4.09	1.36
	1930	36	2,627,000	7,870,000	19	7.22	2.41
Class IV, 100,000 to 200,000 tons	1929	27	3,674,775	11,255,000	12	3.27	1.06
	1930	22	3,123,000	8,643,000	12	3.84	1.38
Class V, 200,000 to 500,000 tons	1929	20	6,156,877	17,618,000	25	4.06	1.42
	1930	17	5,395,300	13,328,000	17	3.19	1.28
Class VI, Over 500,000 tons	1929	7	5,131,234	11,862,000	10	1.95	0.84
	1930	6	4,129,700	10,658,000	7	1.70	0.66
All mines	1929	208	18,416,000	51,683,000	72	3.91	1.40
	1930	200	16,100,000	43,423,000	61	3.80	1.40

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Fatalities by causes are listed in Table 5.

Table 5. - Causes of fatalities during 1930

Cause	1928 and 1929		1930	
	Number	Per cent	Number	Per cent
Falls of rock and coal ..	28	40.0	34	55.7
Haulage	19	26.0	5	8.2
Electricity	11	17.3	11	18.0
Machinery	0	2.9	2	3.3
Explosives	0	2.9	1	1.7
Gas and dust explosions .	12	8.7	8	13.1
Miscellaneous	2	2.2	0	0.0
Total	72	100.0	61	100.0

ANALYSIS OF FATALITIES

In Table 6 the fatal accidents in Alabama will be given for the six divisions as in Table 5 according to cause. Falls of rock and coal increased from 28 to 34; Class I mines had three accidents for falls compared with one in 1929, due chiefly to poorly set and insufficient timber and to lack of supervision. Class II mines had two fatal accidents in dangerous pillar work. Class III mines had 10 fatal accidents in 1930 and five in 1929; of these, 5 were caused by working under loose rock with little or no inspection, 4 were due largely to insufficient timber, and 1 occurred at a high pillar face. Class IV mines had only two fatalities in 1930, the same number as in 1929; both resulted from working under loose rock. In Class V mines there were 12 fatal accidents in 1930 from rock falls as compared to 10 in 1929; 5 deaths resulted from falls at the face where the miner was working under overhanging coal or rock, 2 resulted from falls while working on pillars where men had been forbidden to work, 2 from falls of loose scale in manways, 1 from falls due to insufficient timber, and 2 from falls when props were being knocked out in moving a conveyor and a machine. Class VI mines had seven fatal accidents in 1929 and five in 1930; three in 1930 were due to failure to examine the roof before working and two to insufficient timber.

The increase in fatalities from falls of roof in Alabama's coal mines in 1930 over 1929 may be charged to a lack of care in two mines of Class V and to three mines in Class III, in one of which the use of safety props has since been adopted; one fatality was due to dangerous pillar work, and one to insufficient care in testing roof.

Table 6 lists the fatalities by causes and by class of mine.

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Table.6. - Causes of coal-mine fatalities in Alabama during 1930

Class	Year	Rock fall	Haulage	Electricity	Machinery	Explosives	Gas and dust explosives	Miscellaneous	Total	Tonnage, per cent	Fatalities, per cent
Class I - Under 10,000 tons	1929	1	1	0	0	0	0	0	2	0.9	2.8
	1930	3	0	0	0	0	0	0	3	1.0	4.8
Class II - 10,000 to 50,000 tons	1929	3	0	0	0	0	10	0	13	4.6	18.1
	1930	2	0	0	1	0	0	0	3	4.1	5.0
Class III - 50,000 to 100,000 tons	1929	5	2	3	0	0	0	0	10	13.2	13.8
	1930	10	0	2	0	0	7	0	19	16.3	31.1
Class IV - 100,000 to 200,000 tons	1929	2	5	4	0	0	0	1	12	20.0	16.7
	1930	2	2	7	0	0	1	0	12	19.4	19.7
Class V - 200,000 to 500,000 tons	1929	10	9	3	0	0	2	1	25	33.3	34.8
	1930	12	3	1	0	1	0	0	17	33.5	27.9
Class VI - Over 500,000 tons	1929	7	2	1	0	0	0	0	10	28.0	13.8
	1930	5	0	1	1	0	0	0	7	25.7	11.5
All mines	1929	28	19	11	0	0	12	2	72	-	-
	1930	34	5	11	2	1	8	0	61	-	-

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Eleven fatalities occurred in 1930 and the same number in 1929 from contacts with electricity; two fatalities occurred in Class III - one from pushing a car under low, unguarded wire, and one from contact while a man was in a locomotive on the surface; seven of these fatalities from electrical contacts, all due to low, unguarded trolley wire, were in Class IV mines; the one in Class VI was a case of touching the trolley harp of an electric locomotive while replacing the wheel on the wire at a point where a guard had been placed on only one side of the trolley wire. Two mines in Class IV had three deaths each from electrical contacts. Trolley wire should be raised or guarded in some manner wherever it is less than 6½ feet above the rail, or storage-battery locomotives should be used if deaths from electrical contact with trolley wire are to be eliminated.

Haulage fatalities dropped from 19 in 1929 to five in 1930. Two in Class IV mines were caused by falling from loaded trips; 3 occurred in Class V mines, 1 when a miner pushed a loaded car onto a main haulage road, 1 when a surface wreck occurred, and 1 while a trip was being pushed. The improvement in this type of accident is perhaps due chiefly to curtailed production, for there probably is less nervous haste and the equipment is better able to keep up with the work required when the tonnage requirements are lessened.

Two deaths were caused when men were run over in rooms by mining machines.

A poorly insulated blasting cable and improper requirements in shooting caused one fatality by explosives in a Class V mine.

An explosion or ignition of gas in a Class III mine caused by an electric arc at a working face due to lack of inspection resulted in the death of seven men. One explosion in a Class IV mine was caused by an open light in a slightly gassy mine with poor ventilation.

Table 7 classifies the fatalities by causes and occupation of men:

Table 7. - Fatalities in Alabama in 1930 classified by causes and occupation

Occupation	Rock fall	Haul-age	Elec-tricity	Mach-inery	Explo-sives	Gas explosion	Miscel-laneous	Total
Superintendent		1						1
Foreman	3		1			1		5
Machineman	1		1	1		1		4
Machine helper	4		1	1				6
Motorman	2		2					4
Coupler		2	2					4
Driver		1						1
Miner	19	1	3		1	1		25
Leader	2		1			4		7
Timberman	1							1
Conveyor						1		1
Utility	2							2
Total	34	5	11	2	1	8	-	61

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Table 7 shows the occupations of men killed by every main cause in 1930, and indicates that machinemen were occupied in the most hazardous work; 10 were killed - 5 by falls, 2 each by electricity and by machines, and 1 by gas ignition. Locomotive crews were second in severity according to occupation as compared to the number employed; there were 9 fatalities under this classification--2 from falls, 3 from haulage, and 4 from electricity. Thirty-two miners and loaders were killed--21 by falls, 1 by haulage, 4 by electricity, 1 by explosives, and 5 by gas ignitions.

The fact that, of a total of 61 killed in all occupations in Alabama's coal mines in 1930, five of the victims were foremen appears to indicate that at least some foremen were not giving the proper thought to working safely.

CONCLUSIONS

Apparently, the fatal accidents of 1930 in the coal mines of Alabama were due in a large measure to the neglect of operating officials to work safely themselves or to assume full responsibility for the safe working of the men under them. By the example of those who have maintained operations relatively free even from lost-time accidents, and others who are making every effort to improve their record, it is evident that a large part of the accidents now occurring in Alabama's coal mines can and should be prevented.

The small-tonnage mines evidently need to exercise much more care looking to safety in operation; those mines with annual tonnage under 50,000 had but 5.5 per cent of the State's production in 1929, but had 20.9 per cent of its fatal accidents, and in 1930 these same mines had 5.1 per cent of the production with 9.8 per cent of the fatalities. Neglect of safety in small mines is especially bad in the properties producing less than 10,000 tons per year.

It is evident also that much additional precautionary effort should be expended on the prevention of accidents from contacts with electricity; with 11 such deaths out of 72 fatalities in 1929 and 11 out of 61 in 1930, there is no question as to the seriousness of the electrical hazard in Alabama coal mines. The mines producing 100,000 to 200,000 tons annually appear to need especial vigilance in the use of electricity, as these mines had 4 of 11 of Alabama's coal-mine electrical fatalities in 1929 and 7 of 11 in 1930. In other words, these mines producing about 20 per cent of Alabama's coal in the years 1929 and 1930 had 50 per cent of the fatalities in Alabama coal mines from electrical contacts for the two years.

It is significant also that the 61 fatalities of 1930 in Alabama coal mines all occurred in but 34 of the 223 mines in operation; hence, the 189 mines free of fatal accidents are forced in some measure to bear the burden, or at least the stigma, due to the poor record of these 34 mines.

An inspection of Table 7 classifying the 1930 fatalities in Alabama coal mines by causes and occupations shows that additional precautions must be taken in the use of machinery in the coal mines of this State if the fatality rate is to be reduced. With 10 machinemen and helpers and 8 motormen

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and helpers killed in 1930, plus 1 man killed by a conveyor, 2 by machinery, and 5 men--a foreman, three miners, and a loader--killed by electricity (in addition to employees on machines and locomotives also killed by electricity), it is evident that at least 26 of the 61 fatalities in Alabama coal mines in 1930 were due to machinery in one form or other. In view of the rapid extension of the use of machinery of all kinds in mining, far more precautions should be taken in the installation and use of all types of underground machinery and appurtenances, or the death rate will increase rather than decrease.

That Alabama's coal-mining industry is making progress can be seen in the much better accident rate of Alabama coal mines in 1928, 1929, and 1930, than in the past; it is also made evident in the numerous safety awards recently given to mines, mining organizations, and individual persons in Alabama. The Hull mine of the DeBardeleben Coal Corporation won the 'Sentinels of Safety Trophy' for having the best safety record of the bituminous-coal mines of the United States entered in the National Safety Competition in 1929, and the western division of the DeBardeleben Coal Corporation was awarded a certificate of honor by the J. A. Holmes Safety Association in 1930 for having worked an average force of 893 men for over two years without a fatality or a permanent total disability accident. At its meeting in Washington, D. C., in March, 1931, the J. A. Holmes Safety Association gave one of its certificates of honor to W. B. Hillhouse, chief mine inspector of Alabama, one to the Alabama Mining Institute for excellent service in forwarding safety in the coal mines of Alabama, and one to the Hull mine of the DeBardeleben Coal Corporation for having operated through 1930 with only one lost-time accident; at the Hull mine 11 months and 20 days of the year were worked without a lost-time accident in producing 100,699 tons during 301,763 man-hours of exposure.

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